Teaching Generative Language

Workshop Workbook: NAC

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Generativity:

“Linguistic productivity” (Mallot, 2003):
How can we understand a sentence we’ve never heard before, or say a meaningful sentence we’ve never said or heard before?
Overview

● Early behavioral cusps for generativity:
  ● Generalized operants
  ● Flexibility
  ● Recombinative generalization

● Teaching generative language: Derived Relational Responding
  ● Relational Frame Theory
  ● Assessing DRR
  ● Teaching using existing DRR skills
  ● Teaching DRR
Early Behavioral Cusps for Generativity

Generalized Operants:
- Imitation, echoics
- Identity matching
  - see same/different protocols, Resources p 19

Flexibility:
- New non-arbitrary relational responses, e.g. difference
  - see same/different protocols, Resources p 19
- Contextual control, e.g. multiply-controlled tactual
  - see protocol, Resources p 4
- Verbal modules
- NET

Recombinative Generalization
- see matrix tracking sheet, Resources p 6
- see reference list, Resources p 68
Teaching generative language: Derived Relational Responding

★ **Relational Responding:** based on the relation between stimuli, not the stimuli themselves
  - *Nonarbitrary:* based on physical relations (e.g. identity matching)
  - *Arbitrary:* based on social convention (e.g. names/words and objects)

★ **Derived:** untaught responses emerge on the basis of previously learned relations
  - *Not taught or based on generalization/abstraction*
RFT Overview

**Relational Responding**
- Nonarbitrary vs arbitrarily applicable

**Emergent Relations**
- Mutual entailment: $A \rightarrow B$, then $B \rightarrow A$
- Combinatorial entailment: $A \rightarrow B$, $C \rightarrow B$, then $A \leftarrow \rightarrow C$

**Transformation of Functions**
- Acquired functions of stimuli within a relational network will transform for other stimuli in the network based on the specific relation
Assessing DRR

Research on the Training and Assessment of Relational Precursors and Abilities (TARPA)

- See TARPA outline for SAME, resources p 7
- For access to the TARPA, and the TARPA manual, email siri@siriming.com

- Measures of DRR correlate strongly with language and IQ
  - (also see: Cassidy, Roche & Hayes, 2011; Cassidy, Roche & O’Hora, 2010; O’Toole & Barnes-Homes, 2009; Pelaez, Barnes-Holmes, Rae, Robinson & Chaudhary, 2008)
- Adds support to the possibility that DRR is one of the foundational repertoires for language
- Highlights need for testing and training of auditory relations
- Suggests that the TARPA is an efficient means of assessing core DRR skills
Assessing DRR

Train listener
Mutually entailed tact

“cat”
A: Auditory

B: Visual

Train listener
Mutually entailed tact

“meow”
C: auditory

Combinatorially entailed intraverbal
Assessing DRR

Exercise
Use the assessment protocol for Teach Listener/Derive Tact/Derive Intraverbal for assessing coordination and practice with a partner:

Protocol: Teach listener response/derive tact (mutual entailment)

Introduction: explain that you have some pets and you are going to teach the student the names of your pets.

Step 1: Teach the listener response (A-B)
Step 2: Ensure tact is maintained without continuous reinforcement
Step 3: Test the tact response (B-A)

Protocol: Teach listener responses/derive intraverbals (combinatorial entailment)

Once the student has demonstrated mutual entailment with the name of a pet, go on to test combinatorial entailment as follows:

Step 4: Review the newly learned and previously known listener responses (A-B, C-B)
Step 5: Ensure the listener responses are maintained without continuous reinforcement
Step 6: Test the intraverbal response (A-C/C-A)
Program: Assessing Early Derived Relational Responding

1. Train Listener Responding/Derived Tact:
   1.1. Train A→B Which one is called [A]? criteria= 6 consecutive correct across exemplars
   1.2. Test B→A What’s his name [holding B]? criteria= 5/6 correct across exemplars

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2. Combinatorial Entailment: Derived Intraverbals
   2.1. Review relations A→B Which one is called [A name]? C→B Which one says [C]? criteria= 12 consecutive correct across exemplars (3 per exemplar)
   2.2. Check mixed maintenance A→B, C→B without specific feedback: criteria= 8/8 consecutive correct across exemplars
   2.3. Test A→C (What does [A] say?) and C→A (Who says [C]?) criteria= 7/8 correct across exemplars

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Stimulus Set:
- A1 (name):
- B1 (animal):
- C1 (sound):
- A2 (name):
- B2 (animal):
- C2 (sound):
Teaching Using Existing DRR Skills

Use appropriate pattern of conditional discrimination training to efficiently teach novel relations between stimuli, and/or to use transfer of functions for novel responding

Examples

- Reading and spelling (e.g., Sidman, Cresson, & Willson-Morris, 1974; De Rose, de Souza, & Hanna, 1996);
- Name-face matching (e.g., Cowley, Green, & Braunling-McMorrow, 1992);
- US geography (LeBlanc, Miguel, Cummings, Goldsmith & Carr, 2003);
- Money skills (McDonagh, McIlvane & Stoddard, 1984; Keintz, Miguel, Kao & Finn, 2011);
- Transitioning using activity schedules (Miguel, Yang, Finn & Ahearn, 2009);
- Communication skills including manual signs, picture exchange communication and vocal communication (e.g., Osborne & Gatch, 1989; Rehfeldt & Root, 2005; Halvey & Rehfeldt, 2005; Rosales & Rehfeldt, 2007)
Establishing Initial DRR: Frames of Coordination

★ Move from nonarbitrary relations to arbitrary relations
★ Use standard discrimination training procedures (basic elements of DTT), with a focus on:
  • Bidirectional responding
  • Responding as both speaker and listener
★ Multiple exemplar training, with a focus on:
  • Testing for derived relations
  • Focus on flexibility of responding
Establishing Other Frames

★ What all frames have in common is that they are generalized, contextually controlled patterns of relational responding.

★ Contextual Control—consistent relational cues:
  • Focus on the specific relation to be targeted (same, name, goes with, part of, category, etc.)
  • Establish the relational cue across stimulus sets

For all frames:
  • Teach responding as speaker and listener
  • Teach bidirectional relations between stimuli
  • Focus on flexibility—the relation is key, not stimulus items, method of presentation, etc.
  • Move between nonarbitrary and arbitrary relations
  • Test for mutual entailment, combinatorial entailment, transformation of function
  • Teach multiple examples of relations
Frames of Distinction

see same/different protocols, Resources p 19, 39

- Nonarbitrary
- Nonarbitrary second order
- Arbitrary conditional discriminations
- Arbitrary derived relations

Frames of Comparison

- Bidirectional relations: if this is bigger, then that is smaller
- Flexibility: sometimes this is bigger, and sometimes this is smaller
- Move from nonarbitrary to arbitrary: nonphysical comparisons (e.g. value)
- Test for ME, CE, ToF

Frames of Opposition

- Nonarbitrary: physical relations under contextual control of “opposite” (contrast with “same”)
- Arbitrary: no physical relation, e.g. intraverbal antonyms
Spatial Relations

Nonarbitrary spatial relations

- see nonarbitrary spatial relations protocol, Resources p 50
  - Bidirectional relations: object to base AND base to object
  - Flexibility: items in different relations, base/object reversals

Arbitrary spatial relations

Hierarchy

Class Inclusion: a nonarbitrary foundation for frames of hierarchy

- see class inclusion protocol, Resources p 55

Other Frames...

- Deictic relations: perspective taking (e.g., McHugh, Barnes-Holmes & Barnes-Holmes, 2004; Barnes-Holmes, McHugh & Barnes-Holmes, 2004)

- Analogies: relating relations (e.g., Persicke, Tarbox, Ranick & St. Clair, 2012)